

Application No. 10/686,299
Amendment dated August 23, 2005
Reply to Office Action of June 14, 2005

REMARKS

Claims 11-20 are pending in the application. The Examiner has rejected Claims 11-20.

Specification

Applicants have amended the specification to correct minor errors.

Claim Rejections - 35 U.S.C. § 102

The Examiner rejected Claims 11-20 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,721,162 (hereinafter "Schubert et al. '162"). Applicants respectfully submit that Schubert et al. '162 does not disclose or suggest a micro-machined device assembly including a device wafer, a capping wafer bonded on the device wafer to at least partially define a cavity, and an exposed PN junction diode disposed within the cavity, as called for in independent Claim 11.

Schubert et al. '162 discloses monolithic motion sensor 10, as shown in Fig. 1, including sensing wafer 12, sensing element 14, and circuit wafer 16 bonded to sensing wafer 12 such as to enclose sensing element 14, as shown in Figs. 1 and 9. Sensing wafer 12 is lightly doped P-type and selectively diffused to form deep N+-type regions 24 within the P-type upper silicon layer 12a, as shown in Figs. 2-3. As shown in Figs. 4-5, a high aspect ratio anisotropic etch through one of the deep N+-type regions 24 forms trench 36 in top silicon layer 12a and defines sensing element 14. Sensing element 14 forms a capacitive structure with an adjacent trench wall 24a of the deep N+-type region 24 across gap 38. Nowhere does Schubert et al. '162 disclose sensing element 14 formed as an exposed PN junction diode disposed within the cavity, as called for in Claim 11.

As is known in the art, a PN junction diode requires contiguous P-type and N-type doped regions. Sensing element 14 of Schubert et al. '162 contains *only N+-type doped* material because sensing element 14 is formed strictly from one of the deep N+-type regions 24, as shown in Figs. 1, 4, and 5. Schubert et al. '162 fails to disclose any P-type doped region contiguous with the N+-type doped material found in sensing element 14, as shown by sensing element 14 being separated from contact with the remainder of wafer 12 by trench 36 and gap 38, as shown

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in Figs. 1, 4, and 5. Without the presence of a P-type doped region contiguous with the N+-type doped material of sensing element 14, there is no P-N diode interface as required for a PN junction diode. Applicants respectfully submit that the Examiner's interpretation of sensing element 14 is inconsistent with the specification of Schubert et al. '162 because Schubert et al. '162 does not disclose or suggest sensing element 14 formed as a PN junction diode, but instead discloses that sensing element 14 is formed from only N+-type doped material without a contiguous P-type doped region, as described above.

Because Schubert et al. '162 does not disclose a micro-machined device assembly including a device wafer, a capping wafer bonded on the device wafer to at least partially define a cavity, and an exposed PN junction diode disposed within the cavity, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(b) rejection of independent Claim 11, and Claims 12-20 depending therefrom.

CONCLUSION

It is believed that the above represents a complete response to the Office Action and reconsideration is requested.

In the event Applicants have overlooked the need for an extension of time or payment of fee, Applicants hereby petition therefor and authorize that any charges be made to Deposit Account No. 02-0385, BAKER & DANIELS.

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If any questions concerning this application should arise, the Examiner is encouraged to telephone the undersigned at 317/237-1029.

Respectfully submitted,

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<p style="text-align: center;">CERTIFICATE OF MAILING (37 C.F.R. § 1.8(a))</p>	
<p>I hereby certify that, on the date shown below, this correspondence is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date indicated below.</p>	
<p style="text-align: center;">August 23, 2005</p>	
By:	 Kevin R. Erdman, Reg. No. 33,687